KAIKOURA DAIRY

FARMERS' CONFERENCE

1984

Proceedings of the 1984 Kaikoura Dairy Farmers' Conference held in Kaikoura - 19 July 1984

THIS CONFERENCE WAS JOINTLY

ORGANISED BY:

- Local Farmers
- Ministry of Agriculture & Fisheries
- New Zealand Dairy Board

AND WAS GENEROUSLY SPONSORED BY:

- Alan J Stephens - auto electrician
- Bank of New Zealand
- Beatties Insulators, KG Prill Applicators
- Bernies Discounter - grocery
- Bodmin Nupulse Milking Systems
- Caltex Oil (NZ) Ltd
- Canterbury Savings Bank
- Cumpton & Harris Motors
- DB Adelphi Hotel
- Eades Garage
- Ford Bros - contractors
- Gallagher Electric Fence Systems
- Gill Construction Co - contractors
- Harmon & Co - builders
- Harnetts Furnishers
- H W B Mitre 10
- Ivon Watkin Dow - agricultural chemicals
- Kaikoura Insurance Centre
- Kaikoura Laundry
- Kaikoura Pharmacy
- Kaikoura Printing & Publishing
- Kaikoura Supermarket
- Kaikoura Vet Services
- Ken Watermans Grocery
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- NZ Fertiliser Co - Redene detergent
- Owen Woods - agricultural contractor
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* Ron Annan - paperhanger/painter
* Ross Dunlea - chainsaw repairs
* Sports & Cycle Depot (Kaikoura)
* Stapix Electric fencing
* Tony Taylor - agricultural contractor
* Virgo Fisheries
* V L Smith & Sons - sawmillers
* West End Drapers (Kaikoura)

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SESSION 3: Sponsored by Ivon Watkin Dow.

"DAIRYING IN KAIKOURA"

Marie Davidson
Farmer
KAIKOURA

In 1852 Sir George Grey made the first land purchase in the district - £50 for land in the vicinity of Fyffe House. By 1858 land had been taken up by leaseholders from the Crown, £15 for smaller run with rents a halfpenny for the first 7 years tenure. Runholders were required to have one breeding ewe for 20 acres or a cow for every 120 acres.

And so it was the European came to what had been an isolated district - a settlement with an unique historical background. From the moa hunters in the early years (for it was in Kaikoura the first moa hunters grave was found - in the grave lay the skeleton of a man clutching the largest moa egg yet found. An egg one foot long, and about nine inches in diameter), - through the period Maori occupation - at one stage there were up to 3-4000 Maoris at Kaikoura; thirty years later there were a mere handful, 78 to be precise.

Te Rauparaha played his part in the history of the district, attacking and killing 1400 Maoris on one raid, through the time when whalers worked the coast for 'right' and humpback whales as they came inshore to calve and scrape the barnacles off themselves.

Network roads were set up, swamps opened up, land cleared, and potatoes were grown as a first crop. For about 15 years most

of the small farmers income came from the sale of potatoes to Wellington, the West Coast goldfields and even to distant Sydney.

As long as potato crops showed a profit, dairying was left largely in the hands of the womenfolk of the farm, a wife milking and making butter while her husband busied himself at other tasks.

That just proves my belief that women are the unsung heros of the Dairy Industry. I am disappointed it has taken nearly 100 years for them to grow past the image they are capable only of milking the cows, feeding the calves, and cleaning up the shed when the farmer has a meeting to attend.

The surplus butter was shipped to Wellingtion where its poor quality seldom commanded high prices. We have come a long way since those days. We now have a Company that makes top quality produce.

Kaikoura was to wait another ten years before any major progress in dairying was made. In 1894 a cheese factory was built for the tidy sum of £612. Supplied by 200 cows, each supplier having to cart his milk for which he was paid threepence a gallon.

Marlborough's first co-operative Dairy Company had started business. In those early years 70 ton of cheese were produced per annum, 1929 saw the factory change to butter manufacture and then in 1962 change back to cheese.

When I was asked to present this address I found myself reflecting upon my impressions of the district when I arrived here 13 years ago - a foreigner from that other Island. My knowledge of Kaikoura was very limited - I thought it was goat country, tussock land, Katipo spiders, and I didn't even know about the mountains until the clouds lifted.

In fact it was not goat country but a self reliant close knit community, affected by its isolation, it's strength in its people (2nd & 3rd generation farmers), known to one another - not just a tanker number as happens up north. Farmers who helped one another. I wonder how many bottles of beer have been consumed by neighbours after haymaking. I saw the lack of competition between business houses and service industries and experienced the frustrations of ordering machinery parts from out of town.

I saw dairy farmsthat were slower developed than their North Island counterparts, lightly stocked in comparison, had lots of wasted grass, poor utilisation of feed. I felt then and still do that Kaikoura under-rated itself as a district, with the unrealistic view of the well known high producing areas of the North Island. Before purchasing our farm in Kaikoura we were told by a senior MAF adviser - Kaikoura had some of the best dirt in the country.

Captain Daniels, Company Surveyor, when instructed to look at Kaikoura during his voyage along the East Coast in 1841,

had this to say, 'We found an area of about 8000 acres perfectly flat with the appearance of excellent land.'

Cows are milked in New Zealand where there is the combination of good rainfall and free draining soil - except in a few places like Kaikoura it is rare to have soils of such high levels of natural fertility.

Our climate is good - although some would disagree. Usually we have a uniform spread of rain - an important bonus is the lack of persistant desiccating winds compared with other areas.

Our stock are healthy, we have no eczema, not too many bugs, no crickets and black beetles, but we do have grass grub and porina which Mr French will enlighten us about later in the day.

Our gentle contour, not too many weeds (although we need to keep a watchful eye upon the ragwort), go a long way towards making this a district to be thankful for and a lot to be proud of.

I have been encouraged by the growth I have seen in this district over the last few years. Our returns at the Dairy Company tell of steady growth - up 20% this season, but we are still behind our North Island counterparts.

The New Zealand Dairy Cow census 1982 has our average herd size at 110.7 cows, milkfat per farm 14,514 with milkfat per cow 131.1. This year our farms averaged 20,300 kg.

New Zealand average herd size is 132.7 cows, 19,090 kg per farm with milkfat per cow 143.8.

To fully utilize the plant at the Factory we need more production. It seems as though it is a problem that has been around a long time. I was interested to read in 1896 Annual Report, Directors urged the shareholders 'to supply the Factory with more milk as for nearly the same expenditure half as much again as has yet been supplied could be dealt with'. This is one of the problems of the district - we are so small - just 40 suppliers - Gavin Hampton in the afternoon session will explain to us what this means.

Intensive dairying in which high production is obtained is much more profitable than a low production farm. A high producing farmer not only produces more milkfat but does it more efficiently - because his management is more streamlined. He takes more time to make decisions, more time to think about his management. I believe time should be set aside each day to plan and ponder - with one word of warning - don't do it around the kitchen table - your spouse may think you have nothing to do and give you a domestic chore to keep you busy.

It is important to take time to set goals, assess the potential of the land and then set targets - realistic ones. To assess the potential of your piece of land, often two heads are better than one - it is good to get an outsiders point of view. I suggest we should make more use of our MAF and Dairy Board advisers. They are there to advise us and it is one way of keeping abreast with farming practices that are changing all

the time. As long as we have an open mind to new proposals and adopt an unbiased but realistic approach we can consider the proposal, use what is applicable to our farming enterprise. We need to encourage our neighbours who try out new ideas, ridicule never achieves anything.

It is fine to talk about increase when most of us have bad memories of the two droughts we have recently experienced. It took its toll in many ways - toll on the stock, on the bank account, and our bank manager, as we spent large sums on supplementary feed. It took its toll on our relationships with our families - toll on the farmers confidence - so thank heavens for the good season we have just experienced, it certainly helps to heal the scars and put the bank account in a more acceptable colour.

There will always be difficulties of one sort or another, farming is like that.

I believe one's attitude plays a major role in how we cope with these problems that come our way. A positive attitude will achieve more than a negative one.

It is not always easy to be positive especially as one gets older, as one loses the confidence that youth brings.

Negative attitudes creep in very easily when farming becomes a real drudgery. We therefore have a responsibility to ourselves to ensure that we have adequate holidays, sufficient staff, and regular recreation.

This afternoon there is a session '15 more cows' - some of us will hear the message and say to ourselves, 'Yes I could achieve that, I must set goals with a positive attitude', e.g. upgrading pastures, better utilization, feed induced calving, etc. Others will hear the message and it will fall upon negative ears and they will say to themselves, 'what if there's another drought, I couldn't possibly', so that extra production is lost although it was most likely an achievable goal.

It is exciting that this Conference is happening today. But what of the future? We have a new Government, (the old one went down fighting), the currency has been devalued. The Dairy Board says the devaluation would boost dairy export returns by $240 million which will initially reduce the amount by which dairy farmers incomes will need to be supplemented by our reserves. I am personally confident that the Dairy Board with Mr Graham as chairman will work very hard pursuing the best deals for our produce.

To summarize - As I have tried to outline Dairying in Kaikoura I believe we have the basic ingredients for a high producing area. If we streamline our management skills, keep an open mind, set goals and targets, have a positive attitude and build upon what has already gone before, there is no reason why Kaikoura cannot become the Waikato of the South Island.

"HOW TO GET OUT FROM UNDER UDDERS"

P R Exton
Dairy Board
Consulting Officer
NELSON

Question: How many of you want to milk cows for the rest of your lives?

Hence the importance of the Topic 'Getting out from Under Udders'. I intend to cover the 'on farm' situation, the alternatives you have available and how these work out in practice.
Pita Alexander will then cover the financing and the topic generally from an accountants point of view.

I asked the question a minute ago - How many of you want to milk cows for the rest of your life?

So what are your alternatives:

1) single or married labour
2) contract milkers
3) 29% S/M
4) 39% S/M
5) 50% S/M
6) sell out

Notice that with each step down, the farmer has less and less Input into the farm.

How are all these different alternatives going to affect your pocket.

BUDGETED CASH FLOW FOR YEAR

1/6/1984 to 31/5/1985

INCOME

140 cows @ 19,000 kg MF at payment of 3.40 ¢/kg	=	64,000
90 bobby calves @ $25	=	2,250
25 cull cows @ $175		4,375
TOTAL INCOME		$71,225

FARM WORKING EXPENSES

Wages (permanent & casual)	=	500
Animal health (including bloat) $17/c	=	2,380
Herd improvement: Breeding $11/c 110 c + Recording $1,000	=	2,210
Shed expenses $7/c	=	980
Electricity $15/c	=	2,100
Silage/hay	=	3,500
Fertiliser 5 cwt 30%/a	=	8,325
Repairs & maintenance	=	3,500
Administration: A/cs 700 + phone etc 1,000	=	1,700
Standing charges: Farm Ins, Rates, Rent	=	1,500
TOTAL FARM EXPENSES		$31,895

PERSONAL EXPENSES

$39,000 - Mortgages
- Living
- Tax

As an example I have taken a dairy farm of 180 acres milking 140 cows for 19,000 kgs of milkfat. I have also taken a milkfat payout of $3.40/kg MF. We find a total income of $71,225 and farm expenses of $32,000 leaving $39,000 for living, mortgages and tax.

Now taking this initial budget, how is it affected by the various options.

OPTION A

- single or married labour

Advantages - owner has full farm Input.
- relieves day-day strain.
- release from milking possible.

Disadvantages - housing.
- having to organise work.
- cost $8,500 up.

The original budget figure suplus of $39,000 is therefore reduced to $31,000 - living
- tax
- mortgages.

OPTION B

- 29% sharemilker doesn't own herd or machinery.

Advantages - does all the milking, feeding and calf rearing.
- pays power and shed costs.

Disadvantages - earns 29% of milkfat cheque.
- earns 50% of heifer calves weaning value.
- earns 50% of bobby calf income.
- earns 50% of nett pigs sold.
- housing.

With paying the costs of a 29% S/M the owner now has $25,800 to pay living, mortgage and tax.

OPTION C

- 39% sharemilker doesn't own herd or machinery.

Advantages - responsible for milking, feeding cows.
- responsible for calves.
- responsible for all general farm work.
- pays shed costs, electricity and some fuel costs.

Disadvantages - earns 39% of milkfat cheque.
- earns 39% of bobby calf cheque.
- earns 50% of calves reared weaning value.
- earns 50% nett of pigs sold.

With a 39% S/M the owners share is reduced to $19,000 to pay living expenses, mortgage and tax.

OPTION D

50/50 sharemilker owns herd and machinery.

Advantages - responsible for milking, feeding cows and calves.
- responsible for all general farm work.
- pays for electricity, shed costs.
- pays for animal health and breeding.
- pays for fuel and machinery costs.
- pays for hay/silage, some spreading costs.
- pays for all wages.

Disadvantages - earns 50% of milkfat cheque.
- earns 50% of bobby calf cheque.
- earns 50% of pig nett profits.
- earns 100% of cull stock cheque.
- housing.

With this agreement the owners income is down to $16,000 to live, pay mortgage and tax.

With the 50/50 agreement also take into account that the owner has sold his herd and machinery and could expect some investment interest as income also.

OPTION E

Owner only	For living, Mortgage & tax	
	$39,000	
- plus labour unit	$31,000	decreasing
29% S/M	$25,518	Farmer
39% S/M	$19,900	Input
50% S/M	$15,945	

So straight away you as an owner are restricted in your options due to your financial situation. The three main factors that become crucial in your financial situation are:

Production

Living Expenses

Mortgage Committments.

- The higher the production the more income that is available.
- Living expenses can't really be changed.
- Mortgage Committments - the fewer in $1's the better.

And it is your individual mix of these three factors which determine whether you have a choice of options.

We have looked at the financial aspects of "getting out from Under Udders". Now what about the farmer and his family?

- what do they want?
- how much involvement does the farmer want with the farm?
- does the family want to stay on the farm?

These questions have to be thought about and answered before engaging extra labour or entering a S/M contract.

Good planning is essential - that's why you have farm advisers and accountants - to help you with the options and possibilities available.

To emphasise the planning point:

- a farmer decided he would like to develop other interests off the farm - the financial situation was worked out and he could cope with a 50/50 sharemilker - now of course he had been dairying full time so what was he going to do?
  He decided to move into a 50/50 sharemilker situation slowly.
  For the first year he employed a married man and this extra labour enabled the farmer to get more involved in the Community in social aspects.
  It also allowed him one year to take the time and look around to find and develop other business interests.
  In the second year the 50/50 S/M moved in and the farmer branched fully into his new interests.
  He didn't go straight away into a S/M situation, he planned and moved in slowly.

So in summary - There are many options available but the financial aspects must be examined carefully.

What the farmer wants must be ironed out and the two compromised to make the best solution.

And finally the farm adviser and accountant should be involved in the planning of 'How you can get out from Under your Udders' in the most satisfactory way.

"GETTING OUT FROM UNDER 'UDDERS'"

P S Alexander
Chartered Accountant
CHRISTCHURCH

I suggest there are a few key requirements for an adviser working consistently with farmers:

- a reasonable sense of humour.
- the capability to judge correctly the ability or otherwise of the farmer concerned - and his wife.
- the ability to zero in at a reasonably early stage on the weaker production and financial areas and not be sidetracked.
- the forthrightness to say what you really think rather than what a farmer may like to hear.
- a nature that allows that people are almost as important as profit.
- the attribute of helping a farmer maintain a 'whole farm' approach and run the enterprise first and foremost as a business.

Some of Murphy's business laws are very applicable today as they were 100 years ago - for example:

- Whoever has the gold makes the rules.
- My final decision is - maybe.
- The art of taxation consists of so plucking the goose as to obtain the largest amount of feathers with the least amount of hissing.
- Commonsense is not so common.

* If you put all your eggs in one basket - watch the basket.
* I know him well enough to borrow from - but not to lend to.
* The way to obtain a loan from your bank manager is to convince him you don't really need it.
* The job will expand to fill the time available.
* He is living so far beyond his means it could be said they are living apart.
* Trust everybody but cut the cards.
* There are three kinds of people
  - those who make things happen
  - those who watch things happen
  - those who wonder what happened.
* One way of buying a small business is to buy a big one and wait.

The personal ability of a farmer is the key to many puzzles - there are a fascinating set of characteristics for a very successful farmer from a profitability point of view with these I suggest being:

a) Wife is invariably close to the action although not necessarily physically involved.
b) Doing simple things well.
c) Has very good grip of own financial affairs.
d) Tends to look forward, at least as much as looks back.
e) Invariably in a livestock enterprise has a high production per head and in a cropping enterprise has high yields.
f) Attends Field Days, Seminars and the like and is often prepared to listen to a new idea or approach - often is

only having his or her own actions confirmed from attending these types of event but keeps an open mind.

g) Is the sort of individual to whom hard work and planning are much more important than luck.

h) Tends to have a positive point of view on decision making and in general attitude.

i) Usually a good communicator with advisers and would not move on any major capital decision without first discussing same.

j) Appreciates good advice even though doesn't always move in the advice direction.

k) Invariably has as few wheels on the property as possible but what wheels he does have are in very good order.

l) Takes a very active interest in his annual financial statements regardless of whether the figures are good or bad.

m) Doesn't like overdrafts and debt even though he can cope with it much better than his neighbour.

n) Usually is not content to remain in status quo situation - is always trying to improve on some area of his farming operation.

o) Usually doesn't really appreciate or acknowledge that he is in the top 10% of farmers re profitability.

p) Personal expenses are not noticeably higher than those of other farmers who have a much lower profitability.

q) Tends to avoid hire purchase and similar financing arrangements with plant.

r) His timing re key actions and operations is right regardless of what else has to suffer.

s) Does not have fingers in a lot of pies.

What are the options relevant to 'potential' retirement:

1. Sell completely to outside party.
2. Sell completely to family member.
3. Sharemilker/outside party or family member.
4. Lease property out.
5. Manager/contract milker.
6. Change to dry stock.
7. Some combination of the above.
8. Sit tight - that is continue as before.

What tend to be some of the determining factors that play a part in helping make any decision:

1. Age and health - sometimes makes decision very clear-cut.
2. Attitude, thinking and wishes of wife.
3. Possibly a strong desire to remain involved - perhaps physically, perhaps financially, perhaps both.
4. Family situation re children who may wish to take over- very strong in many cases this feeling.
5. Standard of living required.
6. Previous years profitability and overall financial strength or otherwise of present situation - extent of off farm investments, present working capital position, present debt servicing situation.
7. Where does he want to retire to - live on farm or move off farm - wife will have important feelings here.
8. Present scale of property could determine very quickly in some cases - small scale could mean only support one family.

9. Extent of own and wife's outside interests - this point is often paramount one way or the other.
10. Attitude of family - particularly if living some distance away and no family member interested in getting involved in the farm.
11. Current national economic scene can play a part re farmers' impressions and anticipation re the future.

A farmer's retirement or 'potential' retirement would also involve other considerations such as:

1. The importance of the Rural Bank attitude re funding particularly if family member involved.
2. 'Claw back' provisions if farm land had not been owned ten years at time of sale.
3. Income tax implications re any sale of livestock at market values.
4. Analysis of Income tax spread forward or spread back relief available under several sections of the Income Tax Act which could be very beneficial re reducing potential Income taxes due re sale of livestock to outside party.
5. Advantage of being able to sell livestock to any child or grandchild who takes over the livestock and farming operation at standard values or close to standard values.
6. Possible use of Matrimonial Property Act re an agreement with spouse before sale of land or stock or plant - this comment would probably not apply if spouses were already in partnership re ownership and trading arrangements.

7. Estate Duty implications which could involve gifting at maximum rate of $27,000/year perhaps by both spouses where net assets above $450,000 and where any sale was to family member or members.
8. The debt servicing position of any family member purchasing the farm and livestock will be paramount for both parties as almost invariably there will be a large inter family debt owing and both sides of the family will be relying on the farm to provide an annual income.
9. The wills of the husband and wife could be critical re any sale to a family member so far as the long term future of the new family farming member is concerned.
10. Following on from the previous point some important thinking and planning may be necessary following any sale to a family member re how the retiring farmer and his wife wish long term on their deaths to treat the rest of their children re their respective shares of the family estate - has been the start of a number of stressful family situations in that the family member taking on the farm is in almost every situation going to need to receive a disproportionately large share of his parents' estates in order to be left in a viable position financially.

Over the years I have found the following to be important factors relating to a farmer's successful retirement:

1. Some never really want to retire - I am afraid I may be in that group.
2. There is not a magical age.

3. A successful retirement involves a joint husband and wife decision.
4. A close liaison with Accountant, Solicitor and other relevant advisers is critical regardless of how clear-cut the objectives may be or appear to be.
5. The financial alternatives should be put down on paper and looked at very carefully.
6. Timing and planning is important - overnight decisions can be overnight disasters.
7. The Income tax implications should also be put down on paper and the different relief areas researched.
8. The forward budgeting is critical in any situation where the sale is to a family member - if that family member gets into financial strife it will almost certainly backlash onto you one way or the other.
9. Selling a farm is just as important as buying one - there is no substitute for a certain amount of formality even with a closely arranged family financial transaction - one or both spouses may live for thirty years following retirement and may be dependent for some of their income upon the family member to whom they sold the farm.
10. I find it pays to tidy up the car replacement and other similar capital exercises just prior to or soon after retirement as retirement usually means a much more fixed (although not necessarily lower) income than before and and there is no access to overdrafts, term loans and the like and no enjoyment with hire purchase debts in retirement.

11. Although events sometimes dictate the play, most successful retirements involve several years of forward thinking, planning and discussion with advisers and family.

12. A retiring farmer must treat his own and his wife's financial position as number one priority - generosity towards one's family is one thing but having to rely at some point in the future solely upon National Superannuation and ones children's own generosity in return usually indicates insufficient forward planning. A society which could involve inflation must breed cold bloodedness to help cope with it.

13. Many farmers prefer a gradual loosening of the reins as many farming wives well know. This can be workable in some situations - probably my most successful experiences are where there is a blend of the father's experience and son's enthusiasm with both contributing - but the key will be the father relinquishing control quietly and the son picking it up almost unobtrusively - the other key will be the wife and mother's ability to act as a referee if necessary.

14. At a certain point I don't find deferment of the retirement decision solves anything - there is a time to step forward and a time to step back and it is a lucky man or woman who recognizes the signs. A status quo situation can also have a place - but not for ever.

15. Long periods of lowish profitability or even fluctuating profitability which has been the economic scene for many farmers over the last ten years will invariably

make them very cautious about any venture which is what retirement could well look like from their eyes - as a result any action will be slow.

16. Financial reality is a key factor in retirement planning - there is nothing wrong with being positive and optimistic in fact it is certainly better than the reverse but make sure your plans fit your financial pocket and ensure that your wife and advisers agree with you.

17. It is ironic but a fact of life that many farmers are better off in retirement from an annual income cash flow point of view than they were when actually farming - this comment would apply when the farm is sold outside of family but when sold to a family member it may not apply - the satisfaction or pleasure however most farmers seem to receive in settling a family member usually outweighs most of the associated disadvantages.

18. The importance of job satisfaction cannot be over-emphasised - there would be a large number of New Zealanders obtaining little or no job satisfaction in their present employment. While a farming husband and wife are obtaining sound job satisfaction this will play an important part in determining how quickly or otherwise they wish to move on retirement.

There are a number of sound if not golden rules involved I suggest with a farmer retiring or contemplating same most of which I think I have referred to - the subject though involves people and this will mean the timing, circumstances and methods used will vary from individual to individual.

While there are a number of potential snags and pitfalls which must be negotiated with good planning and advice it is an area most cope with satisfactorily - over the last 20 years I can think of very very few farming retirement arrangements where the farming husband and wife concerned have in any way commented that they would want to tackle the retirement exercise in a different way if they had the chance again.

"GRASSGRUB & PORINA CONTROL IN DAIRY PASTURE"

R A French
Entomologist
LINCOLN

Although grassgrub and porina are natives of New Zealand, both have adapted successfully to pastoral changes. They thrive particularly well on both white clover and ryegrasses, so populations can build up to high levels resulting in severe pasture damage. Despite many years of effort to chemically eradicate these pests, they still cause much concern and financial loss. If eradication seems possible and chemical costs continue to rise what are the alternatives? One suggestion is to manipulate the paddock environment so that insect numbers are always kept so low that only insignificant pasture damage occurs. A second suggestion is to increase pasture vigour to both adequately feed stock and compensate for any pasture pest damage. The third suggestion is to ignore pasture damage, and learn how to cope with varying amounts of it. This approach 'learning to live' with pasture pests would have to rely on encouraging natural control, forward farm management planning, based on the pests population cycles and a change in attitude towards current control methods. To successfully implement these suggestions farmers must at least have a basic knowledge of the pests life cycle and preferably more detailed, biological, ecological and environmental knowledge to predict pasture damage occurrence and severity.

If any of the suggestions are to be implemented, one basic concept must be appreciated. Populations of living organisms all have the potential for unlimited increase in numbers counteracted by forces trying to prevent the increase. The result of this continuous power game is that pasture pest densities are always changing from year to year. The rate and degree of change will depend on how effective are the antagonistic forces. In practice what is happening in a paddock of pasture is that pest populations are always either building up to higher densities or being forced back to lower densities.

Two points arise from this. First what are the agents forcing population densities downwards and secondly could we manipulate them to always maintain acceptably low pest populations, as suggested earlier? Many agents have been researched but only recently has one been discovered that has shown real practical promise. A bacteria commonly called 'honey disease' is now known to be an agent causing grassgrub population collapses. The bacteria, which is specific to grassgrub, can be bred artificially so a large effort is being made to develop it into a practical control technique. In the meantime farmers will still have to use either the costly traditional chemical controls or try using a combination of the second and third suggestions described earlier.

In practice this means that farmers should have enough knowledge to be able to predict a potential problem, assess likely damage, and carry out timely appropriate action. An awareness of impending grassgrub and porina problems can first be obtained

by reading predictions published fortnightly from about January onwards in the farm pages of many South Island newspapers. Further information can be gathered by listening to the radio or watching television. Each farmer should then interpret this overview information for local conditions. Then, if necessary, sample paddocks likely to be susceptible before deciding upon various strategies. Its appreciated that sampling underground insects is tedious and time consuming so some efforts have been made to develop easier sampling techniques. Porina are now easy to sample by merely scraping the soil surface, placing boards over the bared area and counting tunnel holes the next day. Information on damaging levels is also enabling each farmer to decide on whether or not to reduce the population in some way. All this information is detailed in the Aglink FPP 588 obtainable from any MAF office. Sampling for grassgrub is more difficult so few farmers ever attempt it. Consequently, preventative control measures are rarely applied in time. In practice what happens is that strategies are aimed at repairing damaged pasture rather than preventing it. So, until the 'honey disease' becomes a practical and commercial option the following strategies are suggested.

Strategy A

- If sheep are available or can be borrowed, mob stock with a high density, during the winter months. Wet soil conditions are ideal for this technique.
  - Aim for stock densities of at least 1000 ewes/ha, (break feed if necessary)
  - Maintain this density for at least a day, preferably longer.

- If possible feed meadow hay on the visibly damaged areas. This encourages an even higher sheep density and trampling effect and gives some reseeding. An alternative is to hand broadcast some ryegrass seed onto damaged areas before mobstocking.

* Aim to give a 90 day spell between grazings.

Strategy B

* The use of nitrogen in late July or early August is highly recommended.
* Check with a thermometer that soil temperatures at 10cm are at 4°C and rising.
* Apply 30-60 kg of N - say 150-300 kg of sulphate of ammonia.
* Apply the N to damaged pasture if stimulation of previously root pruned plants is required.
* Apply N to undamaged pasture if compensation for grassgrub damage is required.

Plan to graze the N treated pastures about early September.

Strategy C

* Apply an insecticide in autumn to try and protect potential spring growth.
* The use of diazinon at 2 kg ai/ha applied during rain is probably the cheapest at about $49/ha. At least 25mm of rain is required.

Strategy D

* On flat or tractor-accessible land, heavy rolling in either late autumn or spring can be beneficial agronomically.

- A 10-12 tonne water ballast roller used as soon as possible after rain or irrigation will help re-root damaged plants and cause about a 15-20% grassgrub mortality (autumn only).
- This treatment can be made more effective by break feeding cattle on damaged pasture creating 'pugged' conditions, then rolling straight after.

Strategy E

- Do nothing and carry on farming as normal and ignore the grassgrub damage.
- This strategy can work satisfactorily on those farms that are understocked.
- It also requires a certain degree of intestinal fortitude!

Strategy F

- Direct drill grass into damaged pasture in late July/early August.
- Obtain details from your local MAF or farm consultant.
- More recent experience indicates that a better job can be achieved if a herbicide is used to reduce resident plant competition in undamaged areas. The use of, say, paraquat or glyphosate, at low rates could be used.
- Paraquat sprayed on a dull foggy day or in the evening is more effective. The quick burning-off effect is significantly reduced with the herbicide becoming partially translocated.
- An alternative to retarding resident plant growth is to <u>really</u> 'muddy' the paddock with stock before drilling.
- Consider the use of a fungicide dressing on direct drilled grass seed as a pretty cheap insurance against fungal diseases which could hinder germination. Use about 1.5-3 g of Benlate plus 1.5-3 g of Captan per 1000 g of seed.

Cost Comparisons

Assumptions -

* Paddock has 30% of the area visibly damaged.
* Unirrigated average ryegrass permanent pasture on light stony soil - autumn drought conditions.
* Grassgrub damaged areas produce 50% less DM than undamaged between April and September.
* Little or no significant grassgrub feeding by September and natural repair aided by stock management should allow normal DM during and after September.

Strategy A - Mob stocking

Cost of growing permanent pasture approx $15/ha/yr

Say $1.50/month

Normal DM production April-Sept approx 700 kg/ha

less gg damage approx 600 kg

Cost about $10 over 6 months = about 1.7¢/kg DM

(No allowance made for labour - sheep costs etc)

Strategy B - Application of N late July

Normal DM production August = approx 200 kg DM/ha

less gg damage = 170 kg

Expected DM with 30 kg N applied = 600 kg

less gg damage = 500 kg

Extra DM at 1 Sept = 330 = 9.7¢/kg DM (150 kg NH_4SO_4 = $33, material only)

Strategy C - Application of insecticide

Normal DM production July-Oct = approx 700 kg

Less some early gg damage before chemical application = 600 kg

Extra DM at 1 Nov = 100 kg = 40¢/kg DM (cost of insecticide $49/ha)

Strategy D - Rolling

Normal DM April-Sept = approx 700 kg

Less some gg damage = say 600 kg

Rolling may allow normal DM production so, say it gives an extra 100 kg

Cost of rolling pasture = about $14/ha

Therefore Extra DM = 100 = 14¢/kg DM at 1 Sept.

Strategy E - Absolutely do nothing

Unknown psychological cost. Could be $m's!

Strategy F - Direct drilling in August

Direct drilling new grass should give the approx 30 kg DM (Strategy B) lost in Aug

Cost = $20/ha (10 kg Nui @ $1/kg and say $10/ha of drilling).

Therefore Extra DM = 30 kg = 66¢/kg DM at 1 Sept.

BUT no allowance made for advantages to the whole paddock by introducing new grass and re-vitalising pasture which may need the treatment because of drought anyhow!

From the above strategies each farmer can choose either one or a combination, which suit both personal preferences and the farm locality.

In conclusion the following points cannot be over-emphasised.

- know how to predict damage
- be able to assess the amount of damage
- implement methods of control preferably before damage occurs
- develop a set of strategies which will work for each farm.

A lot of information is now available on both grassgrub and porina. It's up to each farmer to ensure that they get this knowledge.

"INCREASING PRODUCTION AT A PROFIT WITH 15 MORE COWS"

Gavin Hampton
Accountant
KAIKOURA

I was talking to Trevor the other day and suggested to him that he could say anything he liked, because after my speech and lunch you would probably all be sound asleep.

First let me introduce myself, I feel that I should declare my interests, because although I am down on the programme as being an Accountant, I am a little more than that in that I am also Secretary of the Kaikoura Dairy Company. I once said that at a meeting in Wellington of representatives of all Dairy Companies in New Zealand, and added that we were the producers of the best Cheddar Cheese in New Zealand and was met by a stunned silence. I'm sure that you are all too good a fan of Kaikoura Cheese to let that go without some comment!

Let me get serious for a while. I'm afraid that I will not be able to say what I want to without quoting some figures. I hope to keep these to a minimum because it is very easy to forget masses of these. I would also emphasize that I will be talking about the Kaikoura Dairy Company, because that is what I know, but I hope to draw from the Kaikoura Dairy Company comments that will be applicable to all Dairy Companies. I shall be looking at the effect on the Dairy Company of an increase in cows: I will not speak specifically

about an extra 15 cows, in the Company's case per supplier, but rather the effects in general of increases in cows.

The largest effects of increases in cow numbers are on costs within the factory due to the increased milkfat, however, extra milk may also mean that larger vats are needed for instance, or perhaps another tanker for pickup. It was to cater for such eventualities that the Dairy Industries Asset Use Payment scheme was set up. This is a sinking fund scheme based on the amount of through put through a factory and therefore is directly related to production from the farms. The amount of A U P monies cannot be paid out to suppliers by way of payment and can only be used to repay existing loans or to purchase new assets. So it can be seen that the increased milkfat will generate funds that can be used to pay for vats etc without completely affecting payout. Let's get on to the more important effect on the farmer of increasing production, and this is the effect on payout in cents per kilogram that the extra milkfat will bring. For this purpose I want to speak for a few moments about three types of costs before proceeding ahead to give a practical example of the effects of increased and decreased throughput. The first cost is fixed costs. These are costs that do not vary no matter how much production goes through a factory. An example of this would be general rates (as opposed to water rates) and another example would be insurance. The second type of costs is variable costs. These are costs that vary directly with the throughput through the factory. An example from the Kaikoura Dairy Company case would be the salt used in manufacturing cheese of a specific type. The third

type of cost that I wish to talk about is something in between the other two, in that over a certain range of manufacture the cost does not alter, but then it does vary, but generally up to a new level where it again becomes fixed. The best example of this type of cost in the Kaikoura Dairy Company example is wages. Here with our plant set up we can employ the same number of labour units no matter what the throughput. Above a certain level, where a second shift would be needed, the cost per kilogram of fat jumps, but then because it stays at that level, the wage cost does not vary with even more production. I call this type of cost a committed cost, because there is committment to meet that cost, at every throughput level.

Okay, so now let's look at the Kaikoura Dairy Company in three situations:

1) Actual costs last year for comparison purposes (651,620 kg of milkfat).

2) Likely costs if a 20% increase in milkfat had gone through (782,100 kg).

3) At the result if 20% less milkfat had been produced (521,300 kg).

As you can see there are some quite dramatic changes. With a 20% increase in production manufacturing costs drop over all production by 8.91 ¢/kg of milk fat or 5.5%. This means that the extra 130,380 kg actually increased

costs by only $139,263 or maunfacturing costs for the extra fat were only 106.81 ¢/kg compared with 163.51 ¢/kg for all the rest. The 20% decrease increases manufacturing costs over all by 16.7 ¢/kg or 10.2%. The reasons for these changes are because of our cost structure and in this case the Kaikoura Dairy Company is much the same as most other Dairy Companies. Most of our large cost items are either fixed or committed and in situations where this exists increased throughput has a direct effect on the payout to all suppliers by dropping manufacturing costs. Mention should be made here of Dairy Board differentials on products, especially as they are likely to stay around for a while. These are purely variable costs and as such affect all production, they therefore have no effect on an increase or decrease in payout through extra production. I also have not spoken about the income side as this amount of income received will vary directly with the increase or decrease in milkfat and the amount per cents of milkfat is not likely to vary, this is of course unless management decisions are made to vary the amount of product going, in our case, to export and local markets. So the overall effect on amounts available for payout for the Kaikoura Dairy Company for last year would have been:

Actual availability	336.34 ¢/kg
+20%	345.25 ¢/kg
-20%	319.64 ¢/kg

So it can be seen that from the point of view of the return to suppliers by way of payout from the factory an increase in cow numbers is certainly very worthwhile.

EXPENSES

	(651,720 kg) 1983	(782,100 kg) + 20% PRODUCTION	(521,300 kg) - 20% PRODUCTION
DIRECT COSTS OF MANUFACTURE			
Wages	223,531	223,531	223,531
Fuel & Power	83,364	100,030	66,670
Materials used in Manufacturing & Wrapping	174,445	209,370	139,550
Laboratory costs	31,007	37,230	24,810
Sundry costs	5,724	6,800	4,540
	518,071	576,961	459,101
	(79.49¢/kg)	(73.77¢/kg)	(88.07¢/kg
OTHER FACTORY COSTS			
A U P	107,598	139,260	92,820
Repairs & Maintenance	26,564	31,910	21,270
Consumable Stores	16,920	20,260	13,500
Rates	5,374	5,374	5,374
Insurances	13,275	13,275	13,275
	169,731	210,079	146,239
	(26.04¢/kg)	(26.86¢/kg)	(28.05¢/kg)
COSTS FROM FACTORY TO F O B			
Freight	75,922	91,110	60,730
Grading & Storage	13,451	16,110	10,740
Factory Truck Running	809	809	809
	90,182	108,029	72,279
	(13.83¢/kg)	(13.81¢/kg)	(13.87¢/kg)
ADMINISTRATION & GENERAL OVERHEADS			
Secretarial & Office Expenses	37,590	37,590	37,590
Directors Fees & Expenses	7,956	7,956	7,956
Audit Fee	1,250	1,250	1,250
Interest NZ Dairy Board	105,978	105,978	105,978
Interest Bank of New Zealand	7,860	9,460	6,310
N Z D B Levies	5,625	6,730	4,480
Staff Travel	3,737	3,737	3,737
	169,996	172,701	167,301
	(26.08¢/kg)	(22.08¢/kg)	(32.09¢/kg)
MILK COLLECTION & FARM VATS COST	121,847	141,320	94,200
	(18.07¢/kg)	(18.07¢/kg)	(18.07¢/kg)
TOTAL COSTS	1,069,827	1,209,090	939,420
	(163.51¢/kg)	(154.60¢/kg)	(180.21¢/kg)
		-5.5%	+10.2%
		-8.91¢/kg	+16.7¢/kg

"INCREASING PRODUCTION AT A PROFIT WITH 15 MORE COWS"

Trevor Stokes
Farmer
KAIKOURA

I aim to tell you what 15 extra cows did for me and to me this past season. I know I am talking to some people who have had more experience than I, but this is our Conference and I live here so you are going to have to listen to me. I want to give you a quick run down of the farm's history. We bought the 20 hectare home farm 24 years ago, with subsequent increases of 16 and then 20 hectares next door, a rather drawn out farm purchase, so that cow numbers have been moving up slowly most of this time. The rainfall is anywhere between 750mm and 1200mm and we have no irrigation so experience lack of growth, due to moisture shortage, at some time during most seasons. The soil is medium to light and subject to spring water after heavy rain on the mountain. This water rises through the gravels causing management problems over a large area of the farm. 340 kg of 30% potash is applied in September having in the past used 400 kg of superphosphate annually. The home farm is divided into 39 paddocks of approximately 1 ha each, and the fencing on the other 16 ha block is made up of a lane with a series of gateways spaced every 45 metres each gate having access to the whole block. Two livestrand are used to make paddock sizes suit the herd.

Grazing management is as follows. Our heifers are grazed off from weaning till rising 2 year olds. In this time

they develop hill country skills in the picturesque Puhi Puhi Valley and later they observe from the Kaikoura Peninsula, the toing and froing of the fishing boats. The cows are wintered off for 6 to 8 weeks on a local sheep farm, an arrangement which has proved satisfactory for many years, and when they return, the rotation has extended to 80 days i.e. 20 days at drying off, 56 or so days while the cows are on holiday. By the end of August the rotation has increased to approximately 100 days and the farm has a reasonable cover of grass. Once home the cows now joined by the heifers are fed half a hectare of grass and hay, sufficient to keep them in calving condition. After calving and when numbers are sufficient cows move into a 12 hour paddock rotation.

I spent the equivalent of 3000 kg of milkfat on grazing and hay is bought in when it is plentiful so last year all the sheds were replenished at reasonable cost, i.e. 4000 bales of standing hay at $1.00.

Well to get back to the subject in a round about way a few years ago I got into a rut milking 125 cows, it was a safe number, I had no feed worries, the per cow production was very high, and grass was going to waste.

There were a few things I didn't like about my rut. I got to feel I was being left behind - I didn't like that, I was being rubbished by my fellow discussion group members - I didn't like that and also I was the full time milker - I didn't like that either so some things had to change. Our hired help at this stage was parttime, just for the evening

milking. At the beginning of the '81-'82 season while contemplating a big tax payment I realised I was working for the Minister of Finance. Following this momentous decision we employed a fulltime assistant, kept our parttime help and removed the blockage, me, from the cowshed. Freed from fulltime milking of 133 cows, I happily oversaw the morning milking, filled in for weekends and started contemplating milking even more cows. I hasten to say that this decision to take someone on fulltime was made easier by the fact that Barb had fulltime employment off the farm so extra money was available when required.

It was in January or February 1983 while Des Clayton was attending a field day at our place that I mentioned I would like to produce 30,000 kg milkfat. Des suggested I had set my sights too low, that 35,000 kg was more realistic. He helped boost my interest and listening to Des speak on drought management, a topical subject because it looked like the district might be entering the second successive summer drought, which it was. I felt reassured by his words and more confident to face another dry season. It also helped to have on hand 320 tonnes of good quality silage which was invaluable in maintaining a good level of production, i.e. 27,300 kg from 140 cows. I didn't get around to any significant increase in cow numbers for the winter of '83, but by June after culling and adding heifers, numbers were up to 148. It was here that my partner contributed an important part in this years increase. Barbara went to the Takaka Conference and came back convinced that we

needed more cows if we were to move ahead. I had decided to stay home to extend the pit and add 3 more machines as milking was taking 2 hours in the mornings, and this was too long. With encouragement from my mates I was able to secure the lease of 10 cows which arrived on 1st August, this brought the stocking rate up to 2.8 cows per hectare. Then doubts started to creep in, growth was slow and the hay reserve was not great, was I right in the head? Why did I let myself in for this, here I was getting older and instead of the pressure coming off it was coming on again. How was I going to feed 158 cows on 56 ha and still cut 16 for silage in early November as was my practice? Could the 40 ha home farm feed 158 cows through the flush? In this state of mind I was more than happy to receive a visit from two Dairy Board Advisers who arrived in the form of Paul Exton and Bob O'Reilly. Bob took out his calculator, fired figures around and came up with the statement that 40 ha would feed the cows adequately with some to spare.

On 1st November we harvested 320 tonnes of silage from 20 ha including 4 ha from the home farm. The cutting time proved to be a week too late, and the area a bit too much, as we went into a fortnight of slow growth in which time the cows scrubbed the paddocks bare and I started to sweat once more. I didn't like the idea that people might be saying I had come a gutser, which I had, and also I dreaded having to start feeding out silage which had just been covered. Here luck seemed to come to my aid, a neighbour offered 10 nights feed and we bounced back into surplus so much so that I was

able to cut more hay and even had to top the whole home farm. We peaked at just over 1 kg per cow but couldn't reach our usual peak, whether this was due to extra cow numbers or a bitterly cold storm or lack of clovers in late October, I don't know. Total production at 31,100 was approximately 3000 kg milkfat or $10,000 up on our previous best. The question arises here 'could I have attained this production with 15 less cows?'. Five cows were lost to the herd from death or culling early in the season, all of which were beyond my control; 2 were culled with Johnnes, 1 died with a twisted bowel, 1 with kidney disease and 1 with persistant nasal haemorrhages. This would have reduced the herd to 135 and as per cow peak production was generally lower in Kaikoura I don't know that 135 of our cows could have produced 31,100 kg, or 555 kg per hectare.

Of course there were costs involved running extra cows. The 10 cows leased at $125 per head, the extra wintering, milking and animal health costs were up. In retrospect I would have experienced less anxiety at the time if I had started the exercise with more supplementary feed reserve. I would also have repaired the stock races thus possibly avoiding 3 major outbreaks of footrot. I hope we have the problem under some sort of control. The races are being repaired and all cows feet have been lifted, checked and all offending cracks cut out. While talking about feet, I was surprised and disappointed that the extra feet didn't seem to harm the grass grub, they carried on building up to reach very high levels.

By now it should be obvious that milking 15 extra cows was profitable to our farming situation and to me the way is clear to increase cow numbers to 3 cows per hectare. Now I am going to tell you about a few more thoughts I've had.

Des, I haven't brought the calving date forward
I've yet to take up the slack
But when the snow hangs low on the mountain
I'm glad I kept them back.

Paul is keen and aspiring
He likes to fly a kite
He seems to be very happy
When the grass is all out of sight.

Peter, our discussion group leader
An allrounder without a doubt
Whenever you ask him a question
His calculator he brings out.

All of you farm advisers
I appreciate your setting of goals
You may have a lot of the answers
But please be aware of my soul.

Farmers, I ask you to listen
This year may not be a ball
For with a new Labour Government
You may need 15 cow profit and all!

"INCREASING COW NUMBERS BY 15 : AT A PROFIT"

P G Yeoman
Senior Farm
Advisory Officer
BLENHEIM

INTRODUCTION

An increase in cow numbers across the district would improve the Dairy Company payout, as indicated by Mr Hampton. Mr Stokes has also indicated that he has found increasing stock numbers feasible.

The purpose of this paper is to indicate the possibilities for profitably increasing stock numbers, and some of the management aspects important in such an increase.

PROFITABILITY

Table I indicates the likely order of expenses for an average Kaikoura dairy farmer running 110 cows and compared with the same farm running 125, or an additional 15 cows. The expenses are drawn from typical farms. The exact levels of these expenditure items will vary between individual properties.

The comparison shows that when cow numbers are raised only the first 7 expenditure items, together with debt servicing are likely to be significantly affected. In individual cases there will be other items affected, particularly where shed design or labour capacity limits expansion, however, these are unlikely to impose limitations on most Kaikoura

TABLE 1

TYPICAL BUDGET

		110 Cows	125 Cows
ANIMAL HEALTH	9600	2400	2800
BREEDING	4800	1200	1400
TESTING	4400	1100	1250
SHED	4200	1050	1200
POWER	7600	1900	2100
FEED	2000	5000	5750
FREIGHT		900	1000
WAGES		4500	4500
FERTILISER		5000	5000
REPAIRS		2300	2300
VEHICLES		5500	5500
ADMINISTRATION		1600	1600
		32450	34400
DEBT SERVICING		13500	14300
TOTAL EXPENSES		$45950	$48700

farms contemplating this relatively modest increase in stock numbers.

For this management change, approximately 40% of total farm expenditure can be considered as 'overhead' or 'fixed' costs.

Table II indicates the likely level of returns and the cash surplus resulting for both these situations. It is assumed that the additional 15 cows can be carried without depressing average per cow production which is assumed to be 150 kg milkfat per annum.

Because of the impact of the 'overhead' costs referred to above, the cash farm surplus has increased much more rapidly than has costs. This can be seen in Table III which indicates the per cow average income, costs and cash farm surplus for both the 110 cow and 125 cow situations, together with the marginal returns, costs and cash surplus for the additional 15 cows.

These figures indicate that for a 14% increase in cow numbers, disposable cash farm surplus rises by 34%.

MANAGEMENT

The major assumption made in these calculations is that there is no change in the average production per cow. In most cases where cow numbers have been increased, this assumption has been proved valid. There are a number of critical

TABLE 2

INCOME

	110 COWS	125 COWS
Mf.:150 kg:$3-40	56 100	63 750
STOCK SALES	1 200	1 350
TOTAL INCOME	$61 920	$70 350
TOTAL COSTS	$45 950	$48 700
SURPLUS	$16 970	$22 650

TABLE 3

COSTS AND RETURNS PER COW

	110 COWS	125 COWS	EXTRA 15
INCOME	563	563	563
COSTS	408	382	183
SURPLUS	$155	$181	$380

management aspects which can be manipulated to ensure that per cow production does not fall, but on the contrary it could rise.

Total production will benefit from a compact calving. A compact calving will result in an increase in average lactation length giving more days in milk and more production. It also results in a 'grazing team' in which all cows are at similar stages of lactation and can be more effectively used for grazing control.

Good cow condition prior to calving is vital. Condition should not be sacrificed in the autumn to prolong production. Many farmers un-wittingly sacrifice a substantial portion of next year's production in an attempt to squeeze a little more production out of the tail end of the season. Cows should be fed well after calving in order to achieve an early, high and sustained peak yield.

Flexibility in stocking management is also necessary with farmers being prepared to dry off some cows early, in order to maintain cow condition, to ensure adequate cows for spring production and to respond to drought. The worst effect of drought is commonly to induce farmers to stock excessively conservatively, and consequently to fail to achieve potential production in most seasons. While the district suffers from periodic dry seasons, most farmers lose more production and money by being understocked in most seasons, than they do as a direct result of drought.

Breeding of high performance cows has shown to not only improve efficiency but also to enable cows to more effectively cope with seasonal feed shortfalls. This becomes even more important as stocking rates rise. Care with the breeding programme is a long term investment, but gives a valuable pay off again in the long term.

GRAZING MANAGEMENT

For most farmers in the Kaikoura area, the greatest potential for increased production and efficiency lies in grazing management. Improved utilisation of the existing pasture production will lead to much improved efficiencies. This means that a higher proportion of the grass that is already being grown needs to be grazed effectively, rather than be left to die and decompose.

There are two simple principles which underlie pasture growth.

The first of these is that plants will grow so far and then stop. This happens because once seed head has been formed, the plant has no further purpose in growth that season and also because once a high bulk of leaf material has been produced, senescence or decay at the base of the sward will exceed further growth, and a net decline in pasture available results.

The second principle is that new growth capacity in both grass and clover plants is stimulated by light reaching the base of the plant. New tiller formation will be suppressed

if pastures are not periodically grazed short particularly in the autumn.

There are a number of practical implications for Kaikoura farmers which result from these principles.

It is important that grazing management prevents pastures from accumulating excessive growth. Such growth will suppress further growth. Reserves which are intended to reduce the effects of drought should be stored in the barn or silage pit, rather than on the paddock.

Silage is a preferred conserved feed and should be made early. Shutting for silage should aim to increase grazing pressure on the bulk of the farm to the point where seed head formation is prevented. By preventing pasture seeding, this stimulates pasture vigour and growth of quality feed in the dry season.

Failure to tighten the rotation in the autumn, in order to bare the pasture base to light and remove any accumulated surplus resulting from lack of control earlier, will result in reduced winter growth. Autumn grazing is the most potent stimulus to winter growth and the ability to winter cows well.

Similarly, a management system which maintains a grazing rotation of say three weeks right up to the point of drying off, and then removes the cows to the run off is likely to result in cows being poorly fed over the winter on low quality

feed while pasture growth on the home farm is depressed. This will result in late and reduced spring pasture growth. While the run off can provide a useful safety valve, it too should be grazed effectively and should not be used to reduce the grazing effectiveness on the home farm.

Pasture grows only if it is grazed. Consequently, the presence of dead grass in the pasture means not only that some feed grown earlier has been wasted, but also that some future feed has been suppressed and will not grow. For most Kaikoura farmers, the biggest single improvement to grazing management that they could make, would be to put on 15 additional cows. This increase in stocking rate would ensure that grazing utilisation improved, improving with it pasture production and quality. This could well lead to an increase in per cow production.

"MAINTAINING PEAK MILK PRODUCTION FOR 80 DAYS"

T Hughes
Lecturer
LINCOLN COLLEGE

In the previous paper some of the misconception about the importance of absolute peak milk yield (flush) have been dispelled. For the purposes of this paper the title has been interpreted as maximizing BF production before the end of December. Maximizing production over this time period requires:

- a concentrated calving pattern
- high breeding index stock
- sufficient high quality pasture to feed cows to appetite
- a suitable stocking rate
- cows in good condition at calving
- healthy cows
- well reared replacements
- efficient milk harvesting

All the above factors can not be adequately discussed in one paper so the paper considers the two factors believed to have the greatest influence, namely concentrated calving and production of high quality pasture.

High Quality Pastures

Feed quality is considered to be synonymous with the term feeding value. Feeding value is the animal production response, in this case milk fat production, from the total herbage consumed. Feeding value is the product of:

(1) The level of intake;

(2) The digestibility of the feed (the proportion of feed dry matter consumed absorbed from the gut.

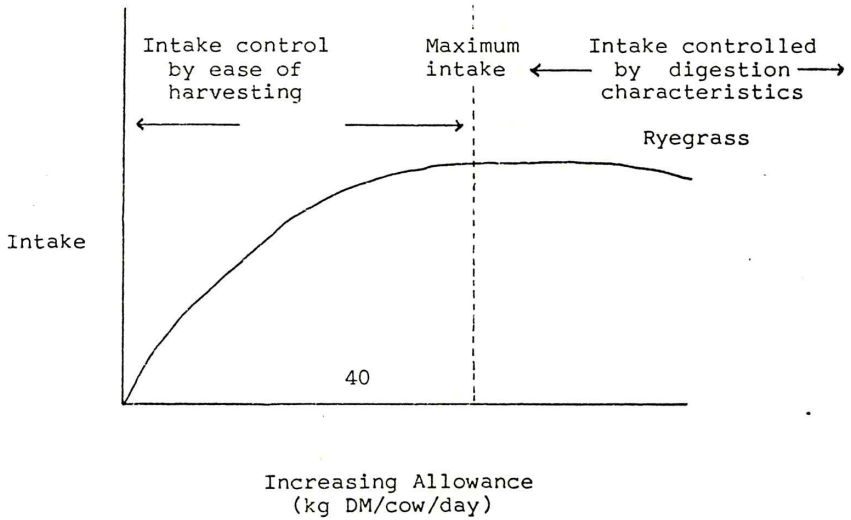
(3) The efficiency of conversion of the absorbed nutrients to product (milkfat).

Intake by the cow can arbitrarily be divided into two components; the ease of harvesting pasture and the digestion characteristics of the pasture (see figure below). Non-nutritional factors such as the amount of dry matter per hectare on offer, the allowance per cow (kg DM/cow/d), the proportion of leaf to stem and the distribution of leaf, stem and dead material within the canopy of the sward, can greatly influence intake. A cow's daily intake is the product of the rate of intake and grazing time. Rate of intake is influenced by the non-nutritional factors listed above. If the preferred pasture components of grass leaf and clover are not readily accessible, the cow may stop grazing long before it has reached the level of intake of which it is capable. Such a reduction in intake is unrelated to the digestion characteristics of the feed.

Differences between pastures in maximum intakes are related to how long feed stays in the rumen. Thus high fibre feeds (low digestibility) provide small amounts of nutrients but also remain in the rumen a long time thus reducing the cow's capability to consume more feed in a given time.

Responses in terms of increased yields of milk and milkfat have been obtained by supplementing the protein supply of

Figure 1: The relationship between increasing allowance (amount of available feed/cow/day) and intake.



pasture fed cows in early lactation. Increasing the balance of legumes in diet also results in greater milk production. Pure legume swards or specialized protein supplementation of cows cannot, however, be considered practical at present.

A cow's appetite after calving increases more slowly than her level of milk production. During this period the energy output in milk exceeds the energy the cow is capable of harvesting. High BI cows are capable of producing at a level of 90% of their 'flush' within 2 to 3 weeks of calving. Yet a comparable level of appetite to consume sufficient energy for this level of milk production is not reached until 10 weeks after calving. Feed quality as well as quantity must therefore be high in early lactation to promote the highest possible intake. However, because the feed intake of a high producing cow cannot meet her requirements she will still have to mobilize body reserves even where pasture conditions are satisfactory. For these reasons condition score at calving will influence a cow's production in early lactation.

Winter pasture management should aim to produce dense leafy pastures of 10-15cm in height for calving. Such swards will have a high density of individual grass tillers with a high proportion of leaf to stem. Pastures which provide copious readily accessible leaf can be grazed intensively without affecting cow or pasture productivity. Individual tillers are slower going to seed in the late spring summer period because of the high density of competing tillers.

Pasture that gets too long (greater than 20cm) prior to calving has fewer but larger tillers. Such swards contain a similar amount of leaf to the shorter swards but much larger amounts of stem and dead and decaying material. These tall swards shut out sunlight to the base so pastures eventually become open and clover struggles to establish. Large tillers rapidly go to seed in late spring and are slower to recover from grazing.

Control of pasture quality in late spring is also crucial for ensuring high milk production. Every spring for a short period of time, pasture growth invariably exceeds cow demand. Herbage mass increases, leading to a sward with a high proportion of reproductive tillers and seed heads, and eventually rank material and litter. Such material not only provides poor quality feed which depresses animal performance, but also reduces subsequent pasture growth because of shading. The height and spatial distribution of plant components within the herbage canopy also changes. Reproductive seed heads dominate the top layer. Grazing intake may be reduced as the more preferred leaf is less accessible in the lower parts of the sward, and is mixed with dead material. In a recent trial at Massey University the effects of offering lactating cows 'high' or 'low' quality pastures were studied. The composition of the two pastures, measured in December, is shown below.

	High Quality	Low Quality
Total herbage yield (kg DM/ha)	2480	5260
Digestibility of DM	73	65
Composition: % leaf	45	29
% stem	24	41
% clover	7	12
% dead	10	17
% weed	4	2

Twelve pairs of identical twins were grazed on these pastures during December and given either a high or low pasture allowance; the results are shown below:

	High level of Feeding		Low level of Feeding	
	High Quality	Low Quality	High Quality	Low Quality
Herbage allowance (kg DM/cow/day)	48	48	12	12
Apparent herbage intake (kg DM/cow/day)	21	16	7	8
Post grazing residual yield (kg DM/ha)	1460	3540	1110	1810
Milkfat produced (kg/cow/day)				
- before experiment	0.86	0.89	0.84	0.77
- 2nd week of experiment	0.80	0.67	0.68	0.51
- change	-0.06	-0.22	-0.16	-0.26

The high quality pasture had a higher portion of leaf which was readily accessible and therefore consumed by the grazing cows. It was apparent that even when cows were fed very

generously on the low quality pasture they were unable to eat sufficient to maintain milk production. Conversely, cows fed high quality pasture were able to graze relatively intensively without showing large decreases in production.

Pasture quality can be maintained in the late October/ November period by a combination of grazing pressure and conservation or as a last resource topping or more correctly 'bottoming'.

Conservation as silage or hay aids pasture control by mechanically removing seed heads and rank material. Grazing pressure on the farm area not involved in conservation is increased, making seed heads more susceptible to grazing and preventing the build-up of rank material. The duration of this increased grazing pressure depends on the growth rate of the hay or silage aftermath. Silage offers many advantages as a method of conservation. It can be cut earlier because of less dependence on the weather, which allows regrowth during the more favourable growth period. Silage is of higher quality, and generally cheaper than other forms of conservation. If the area removed from the rotation for conservation proves too optimistic, silage paddocks can be readily re-introduced for grazing.

Concentrating the Calving Pattern

One of the most critical decisions effecting utilisation of grass grown and therefore income made by seasonal supply dairy farmers is the date on which the breeding programme will begin. This date dictates the planned start of calving 282

days later and together with the conception pattern, allows prediction of the feed demand of the herd. Because variation in calving date is the major factor influencing lactation length among cows with a herd, monitoring and control of calving patterns is important. Provided adequate preparations are made to feed cows well in early lactation, each extra day achieved by concentrating the calving pattern should increase yield by 0.7 to 0.9 kg milkfat/cow. Calving patterns for next season are known prior to drying off if good records are kept. Feed supply for the following spring can therefore be planned well in advance. In the table below, calving pattern details in 35 Matamata herds and a Ruakura herd are compared.

Interval	Ruakura No. 2	Matamata	Lactation days lost per cow in Matamata herds
Planned start (PS)	15 July	5 August	
PS to Median (days)	15	18.3	(3.3 x 0.5) = 1.7
Median to 75% (days)	15	18.3	(3.3 x 0.25) = 0.8
Last 25% (days)	19	36.3	(17.3 x 0.25) = 4.3
Total calving period (days)	46	72	6.8

This analysis suggests that the greater spread of calving in the Matamata herds meant a reduction in herd lactation length of seven days per cow and this could have been obtained without altering PS of calving date. A concentrated calving also aids in pasture management, by maintaining quality pastures established at the end of winter.

High per cow and per hectare goals seem antagonistic to some farmers but generally offering high quality pasture to cows

will result in very good per animal and per hectare production. Except in the extremes, farmers with high stocking rates achieve better per cow and per hectare production than their neighbours with lower stocking rates.

Cows on farms with low stocking rates are generally underfed as pasture quality rapidly deteriorates during the season. High stocking rates produce higher quality pastures and as long as these pastures are not over-grazed resulting in tiller death and consequently slower growth rates, high per cow and per hectare production can be obtained.

Conclusion

Retaining peak milk yield for 80 days may be wishful thinking, however, production before the end of December can be maximized by creating and maintaining high quality pastures and having a sufficiently high stocking rate and concentrated calving to convert this to milkfat.

"MAINTAINING PEAK PRODUCTION FOR 80 DAYS"

John Roadley
Farmer
ASHBURTON

What did you peak at? A familiar question when dairy farmers gather. I'll agree there is momentary glory in being able to tell others that the herd has done a kilo or better. Even if the calculation is done using yesterdays cow numbers, todays milk weight, and tomorrows expected test.

I really believe that the concept of peaking, as many of us understand it, is wrong if total production and profit is the objective. Because while we are chasing the magical figures other aspects of management can be compromised with a subsequent cost.

Holding the peak for 80 days:

Fig.1 - If your production graph looks like that and you had hoped that I could tell you how to hold it for 80 days - forget it.

Fig.2 - If you have a widespread calving likely you may have a graph like this. Holding the peak is no problem. However lack of production will be a problem because of inadequate cow days in milk. So obviously it is unwise to have an 80 day peak as an isolated objective, but perhaps as part of wider objectives it may be on.

Fig 1 Milkfat Production
Kg-cow-day

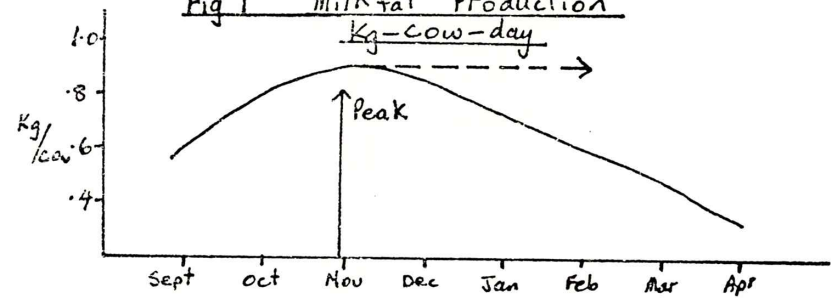


Fig.2 Milkfat Production Kg/cow/day.

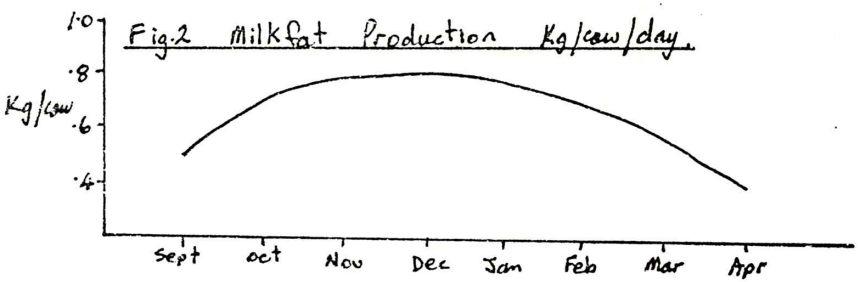
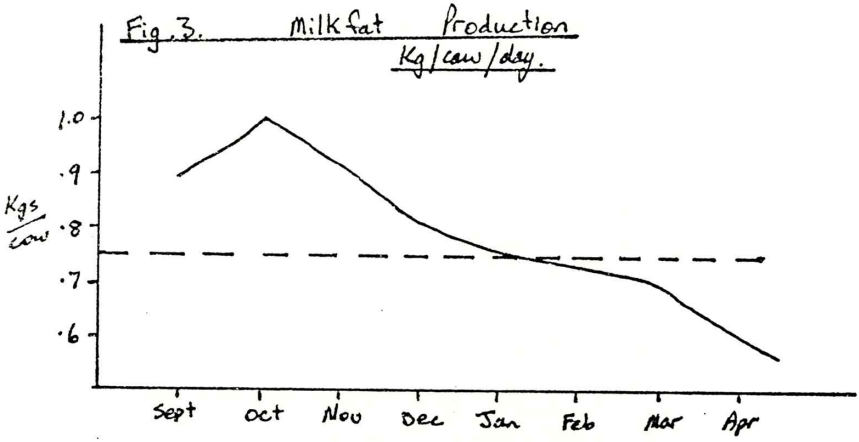


Fig. 3. Milkfat Production
Kg/cow/day.



So let's set some targets.

Another speaker is going to describe what makes a 500 kg milkfat/ha farm so I will work backwards from there.

Stocking rate = 3 cows/ha, production = 170 kg/cow, gives 510 kg/ha. Assume a 225 day lactation, we need to average .75 kg/cow/day - a good target by anyones standards.

So could it be that the production graph should look like Fig.3 which to me does not denote a peak at all.

It will however give 225 day average of .75 kg/cow/day and the target of 170 kg/cow. It also gives 100 days at .8 kg and 80 days at .85 as in Fig.4.

Fig.5 shows the graph comparing the previous season, this resulted in a per cow of 150 kg or 20 kg/cow less. Main points of difference:

(a) cows slightly lighter at calving.
(b) inadequate feed in September.
(c) chased per cow peak during November/December.
(d) feed quality deteriorated November/December.
(e) production drops and never recovers.

Main points to achieve the better performance:

1) Quality cows: Analysis of this years herd testing records shows a 48 kg/cow difference between the group of cows

Fig 4. Milkfat Production Kg/MF/day.

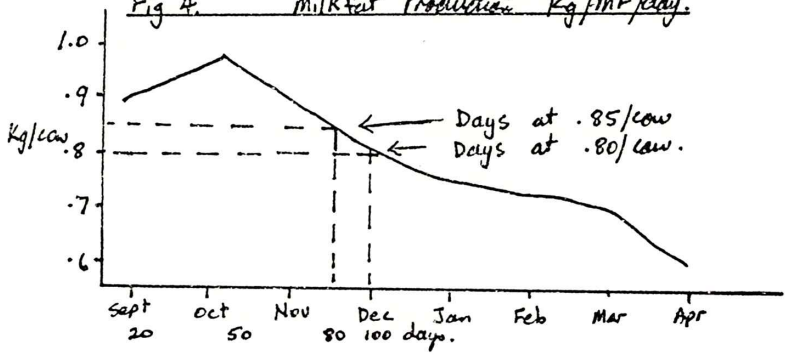


Fig 5 Milkfat Production Kg/cow/day.

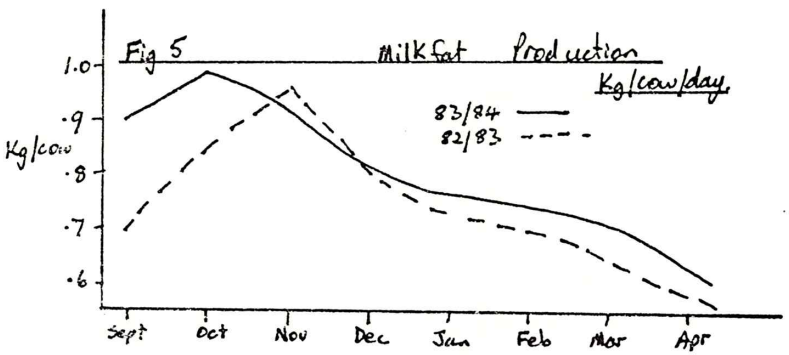
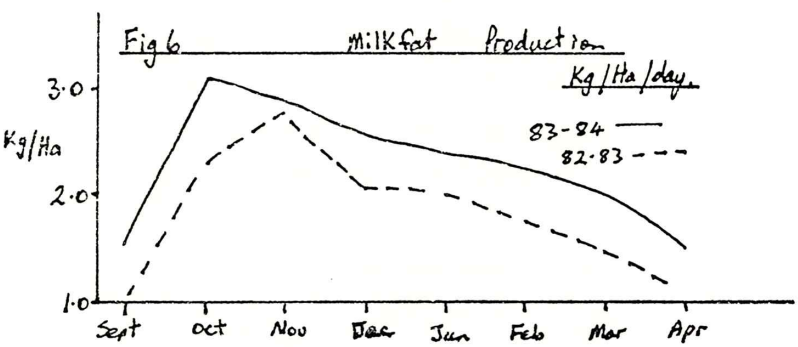


Fig 6 Milkfat Production Kg/Ha/day.



in the under 95 P.I bracket and the remainder in the over 95 P.I herd.

2) Cow condition and health: All cows need to be in good condition with 2 yr old being extra good. To ensure a low incidence of metabolic problems, magnesium supplementation may be needed.

3) Concentrated calving: A well covered topic, however a 45 day calving spread with mid-point at 15-17 days from planned start.

4) Milk harvesting techniques: Have regular machine checks. No electricity leakage problems, a quiet milking routine.

5) Adequate quality feed: To ensure the herd begins at .8 kg and never looks back there must be enough tucker. The balance between cow condition at calving and the feed supply at calving needs careful planning. Fat cows at calving is a poor excuse for under feeding in early lactation.

6) Spring pasture management: Rapid pasture growth, means management decisions have to be rapid also. Continuous monitoring is necessary. Aim for about 50% usage of feed from 2600 kg/DM/ha to a post grazing residue of 1200-1400 kg/DM/ha. Not the common 4000 kg/DM/ha down to 2000 kg/DM/ha. Conservation needs to be done early and quickly. If all else fails then top (or bottom) the pastures.

Many of the above points are illustrated in Fig.6.

A slightly lower stocking rate of 2.8 cows/ha (3 cows/ha in 83/84) in 1982/83 and a spread calving gave a much poorer production on a per ha basis during September/October. Lax grazing during October/November in 82/83 saw production rise into November then the high percentage of poor quality feed on offer dropped the production during December.

The higher stocking rate and tighter calving of the 83/84 year gave an early rise to 3 kg/ha/day milkfat produced. Strong emphasis of pasture quality with grazing pressure, a change from hay to silage as the conservation measure, gave an earlier decline but at all times production per ha remained higher than the previous year and over the season resulted in a substantial per ha improvement.

CALVING PATTERNS AND CALVING DATES

K.L. Macmillan

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Summary

Many herd owners convert less than 70% of the pasture dry matter grown on their properties into milkfat. Most of the lost dry matter decays after it has become unpalatable and of low nutritive value. In many cases, the percentage of utilisation of dry matter can be improved by increasing the stocking rate. It can also be improved by altering the herd's calving date and calving pattern, especially if the herd contains animals of high genetic merit.

The objective in this case is to increase absolute levels of production obtained from a herd before 31 December. This does require a greater application of pasture management skills to make best use of winter pasture and to maintain pasture quality for as long as possible. The desired changes can be implemented and monitored by analysing calving patterns. The components of a calving pattern include the planned starting date, the interval from this date to the mid-point and the intervals for the third and fourth quarters of that pattern.

Concentrating the calving pattern increases a herd's period of "flush" production but should also increase the herd's submission rate and conception rate. It should also reduce the herd's empty rate even if it means that a slightly higher percentage of cows are induced.

Although a herd's planned start for calving will be influenced by the date from which spring growth in pasture can be expected to commence, most

herds must maintain a seasonally concentrated calving pattern because of the variation in spring, summer and winter growth rates in pasture.

INTRODUCTION

Prices received by New Zealand farmers for livestock products dictate the use of low cost husbandry systems. This is partly because most of these products must be processed and then transported to European or American markets. New Zealand's geographical location is favourable for low cost husbandry systems. Animals do not have to be housed, and the growth of permanent improved pastures occurs at varying rates for seven to nine months of each year. These two factors in turn can reduce the need for feed conservation from pasture or crops, and minimise the labour requirements.

When this "production environment" is related to dairy farming, the concept of efficient herd management can be defined as "the effective utilisation of pasture dry matter for the production of milkfat at a minimum cost per unit of milkfat". The components within this definition are having sufficient cows in milk at those periods when most grass is available. Because cow efficiency varies with stage of lactation, a herd's calving date, calving pattern and stocking rate must be varied to suit the normally expected changes in the seasonal pasture growth patterns in a particular region. Skill is required to integrate the herd's dry matter requirements with present pasture availability and predicted pasture growth rate. Many herd owners do not detect disparities between predicted and actual pasture growth rates in sufficient time to implement effective remedial measures. Consequently, some herds are unnecessarily underfed at critical times such as early lactation, or pasture quality deteriorates during the flush because silage making was deferred for too long.

The twice-a-day milking routine is the aspect of management which has a fixed labour requirement. Fortunately, shed design and milking machine

technology have allowed progressive increases in cows per labour unit. This has resulted in increasing herd size, but the additional cows per herd have been grazed on extra land rather than by increasing average stocking rates. This is probably because the management of a larger herd through applying labour-saving technology is comparatively uncomplicated and requires less skill than increasing the stocking rate.

Seasonal calving and production patterns are features of New Zealand dairy farming. Getting the cows pregnant as conveniently as possible and then grazing pasture which had been stimulated by using artificial fertilisers (mainly containing phosphate and potash) were accepted objectives until relatively recently. During the last decade this emphasis has been modified to include animal and pasture quality. The greater efficiency of genetically superior cows and the effect of pasture quality on the ability of these cows to express this superiority are now widely recognised. High BI cows consume more pasture dry matter but will also graze down pastures to lower levels. They also show better recovery from brief periods of underfeeding, possibly because these high BI cows are less inclined to convert intake into liveweight gain as extra condition. These attributes can also be utilised to increase lactation length by calving earlier to increase the proportion of the herd's annual output produced before the end of the year. Earlier calving as a means of increasing production can contribute to improved pasture control without increasing stocking rate. Nonetheless, effective pasture utilisation and conversion to milkfat will still require an adequate stocking rate to reduce the need for frequent topping or substantial pasture conservation as hay or silage to control pasture quality.

These are the numerous factors which must be taken into account when deciding on the most appropriate calving date, calving pattern and stocking rate for a particular farm. Within one locality each of these factors may

differ between adjacent properties because of topography, stage of development, herd quality or availability of grazing during the dry period.

CALVING DATE AND CALVING PATTERN

Recent field surveys conducted in the Waikato have defined parameters which allow selected herd statistics to be compared. The consequences of a herd's breeding management programme in the previous season can also be monitored to identify aspects of the programme which may require further improvement.

The parameters which are required for these comparisons include:

(i) planned start of calving (PS) which is the date on which a cow which conceived on the first day of AB would normally be expected to calve (ie. a gestation length of 282 days);

(ii) the interval in days from PS until 50% of the cows (excluding the first calving heifers) have calved. This intervals is termed PS to mid-point;

(iii) the interval from mid-point until 75% of the cows have calved; or mid-point to 75%;

(iv) the interval from 75% until the last cow has calved excluding those which calve after an interval of 7 days during which no herdmates calved. This effectively excludes the odd "straggler" and the interval is defined as 75% to end-point; and

(v) total spread of calving (TS) which is the interval from PS to end-point.

The first calvers are excluded because their breeding management as yearling heifers will have differed from the rest of the herd. Nonetheless, the relevant calving pattern statistics for the heifers should still be calculated and at least the PS to mid-point and mid-point to 75% intervals

should be shorter than for the rest of the herd. The calving pattern is divided into the three intervals because:

(i) the PS to mid-point reflects the effects of breeding management during the first round of AB in the previous season. A high submission rate with a satisfactory conception rate should produce an interval of around 15 days;

(ii) mid-point to 75%, reflects the effects of breeding management during the second round of AB or the first round of natural mating after AB;

(iii) 75% to end-point is influenced by the length of the breeding programme after AB together with the extent to which induced calving was used and when the induction programme was applied in the current season; and

(iv) the TS indicates how many days would elapse from the end of calving until AB would be expected to start if the PS was to remain unchanged in the following season. The last cows to calve, excluding the odd "straggler" are usually induced cows and AB would usually be expected to start 83 days after PS.

GAINING EXTRA DAYS IN MILK IN EARLY LACTATION

Before comparing calving pattern results from commercial herds included in a recent survey, it is useful to consider the effects of calving date on per cow production. Within one individual herd, calving date will usually dictate lactation length because almost all cows are dried off on the same date. Therefore, if a cow calves one day earlier than a herdmate, the first cow will be in milk for one day longer. Ruakura trials with twins have consistently shown that the extra day's production for the earlier calving cow is an extra day's production equivalent to flush production for that cow. That is, the extra production is not added on at the end of lactation

when production levels are low but is added on to the flush when production levels are high.

In these trials, increasing lactation length by concentrating the calving pattern increased per cow averages by 0.8 to 1.0 kg mfat/cow for each day gained by concentrating that pattern. A comparison with results from a survey in 31 Waikato herds showed that the average expected increase for cows in commercial herds would be 0.7 kg mfat per extra day. It is important to recognise that this is a within herd comparison and will therefore be influenced by cow quality and level of feeding. In a well fed herd of high BI cows each extra day may be worth an additional 0.9 to 1.0 kg/cow whereas in a poorly fed herd, especially with low BI cows, the response rate could be halved.

The reasons for the possibly higher than expected increase in production through concentrating the calving pattern are that all the cows in a herd tend to decline in production at a similar rate from a similar date, and that a dry autumn will affect all cows in a herd in a similar manner. While the autumn effect is fairly obviously due to a feed shortage, the post-flush effect is thought to be due to declining feed quality possibly combined with more cows becoming pregnant.

Herds also differ in their PS of calving with some being described as "early" and others as "late". In most cases, "early" herds may suffer a more severe or longer feed shortage in early lactation than "late" herds. The cows in an "early" herd would also be at a more advanced stage of lactation when the "post-flush" decline in pasture quality occurred. A recent Ruakura trial showed that a group of twins with a mean calving date 37 days earlier (mid-July) than their contemporaries (mid-August) had produced 30 kg more milkfat/cow by the end of October. The later calving group declined at a slightly slower rate from a similar level of flush production (0.84 kg/cow/day), but could only regain 8 kg milkfat/cow by the

end of lactation. Consequently, the earlier calving group averaged 22 kg milkfat/cow more than the later calving group.

This result suggests that provided changes can be made in pasture production, pasture management and feed planning, an earlier PS for calving should increase spring and early summer production averages and also increase seasonal production per cow by an average of 0.6 to 0.7 kg milkfat/cow/extra day with no change in calving pattern. This increase will be influenced by cow quality.

RESULTS FROM COMMERCIAL AND RESEARCH HERDS

Calving dates for each cow in each of 35 herds in the Matamata area of the Waikato were analysed to study between herd differences in calving pattern and to compare them with the Ruakura No. 2 herd. This herd comprises high BI AB Friesians stocked at 3.7 cows per effective hectare excluding young stock. All comparisons relate to the 1982/83 season. Induced calving was used in 32 of the 35 Matamata herds with an average of 11% (range 1.4% to 26.1%) of the cows being induced in these 32 herds. The No. 2 herd induced 15.8% of cows.

The results are summarised in Table 1. They show that the No. 2 herd has a PS 21 days earlier than the average for the Matamata herds (15 July vs 5 Aug), or 8 days earlier than the "earliest" Matamata herd and 34 days earlier than the "latest" Matamata herd. On average, these herds had 18.3 days from PS to mid-point compared to 15 days in the Ruakura herd. Many of the Matamata herds had intervals equal to or less than the Ruakura herd.

The Ruakura herd gained extra "days-in-milk" with a shorter interval from mid-point to 75% (12 days vs 17.5 days). However, the greatest difference was the the interval 75% to end-point which was 19 days in the Ruakura herd compared to an average of 36.3 days in the Matamata herds.

Table 1: Calving pattern intervals in 35 Matamata herds and a Ruakura herd in 1982.

Interval	Matamata herds		Ruakura No. 2
	Average	Range	
PS (date)	5 Aug	23 Jul-18 Aug	15 Jul
PS → mid-point (days)	18.3	12-25	15
Mid-point → 75% (days)	17.5	8-28	12
75% → end-point (days)	36.3	12-72	19
TS (days	71.9	45-107	46
Induction rate (%)	11.4	0-26.1	15.8

This meant that the TS interval in the Ruakura herd was only 46 days compared to 71.9 days.

It should be noted that on average, the calving period for the third quarter of cows in the commercial herds (Mid-point to 75%) was as long as for the first half of the herd (PS to mid-point) (18.3 days vs 17.5 days). The last quarter calved over an interval as long as the first three quarters (ie. 36.3 days vs 18.3 + 17.5 days). Consequently, most of the later calving cows in the commercial herds (which would have been induced cows) were calving 72 days after PS or eleven days before the start of AB. In contrast, the cows in the Ruakura herd completed calving 37 days before the start of AB.

The combination of an earlier PS and a more concentrated calving pattern increased the average period in milk by the end of October by 28 days per cow for cows in the Ruakura herd. This 28 days comprised 21 days from an earlier PS and 7 days from a more concentrated calving pattern.

While the major factor was the earlier PS, the shorter total spread in calving should have significantly improved subsequent reproductive efficiency. Even the later calving cows in the Ruakura herd had at least 5 weeks before the start of AB or 8 weeks before the end of the first round of AB. Consequently, this herd regularly obtains a 3-week submission rate of at least 90% and a high conception rate. Although the total breeding programme is only 3 months (Oct-Nov-Dec), the final empty rate is usually 5% to 7%.

Detailed analyses for each of the 35 Matamata herds showed that a herd's TS was not related to its PS. In other words, later calving herds did not have more concentrated calving patterns to possibly compensate for or counteract the later PS. Even if this had been the case, concentrating the calving pattern can only reduce a herd's mean calving date by up to 7 or 8 days unless that herd has a prolonged and slow calving pattern. While greater overall gains in lactation length can be achieved by altering a herd's PS, the potential advantages of maintaining a concentrated calving pattern, irrespective of PS, relate partly to production and lactation length but mainly to increasing a herd's submission rate and conception rate. If both of these factors can be improved, then the herd empty rate should also be reduced.

RELATING RESULTS TO KAIKOURA HERDS

The Ruakura No. 2 herd comprises "Friesian" cows with an average BI of 126 and stocked at 3.7 cows/effective hectare. In 1982/83 the 96 cows in the four highest producing herds averaged 192 kg/cow and 708 kg/ha. The comparative figures in 1983/84 were 200 kg/cow and 740 kg/ha. However, a most impressive aspect of these herds' performance is that by 31 December, the cows have already produced 130 kg milkfat/cow and over 480 kg milkfat/ha.

The three components of this high "pre-autumn" production are stocking rate, days in milk and average daily yield.

To achieve an average for the whole herd of 150 days in milk by 31 December requires a mean calving date of 3 August. If the herd averaged even 10 fewer days in milk because of a later or less concentrated calving, maintaining milkfat per hectare would mean lifting daily yield or stocking rate to what at present seem unrealistically high levels. The current average daily production per cow from calving to 31 December is 0.88 kg.

Whereas trials in the late 60's and 70's showed production gains per hectare could be obtained by later calving and higher stocking rates, these trials did not use high BI cows now available to all herd owners. Nonetheless the current Ruakura system may not be applicable to low BI herds.

One aspect of the results which should have application to Kaikoura/Marlborough dairy conditions is the concept of adopting management procedures which maximise "pre-Christmas" production. Moving earlier with a herd's PS will increase the management challenge which must be accepted by the herd owner. Greater emphasis must be placed on pasture management and feed allocation during the dry period. Whatever system is used, the objective should be to have all winter-grown or winter-saved pasture eaten out by the time the spring flush commences. This will usually result in better quality feed being provided during the flush with pasture control being maintained through at least November.

In a recent study using records from over 4000 Waikato herds, it was found that production per cow on a seasonal basis was largely dictated by the level of daily production during a 31-day flush period and the rate of decline thereafter. Best production figures were obtained by combining a high sustained flush with a slow decline from that plateau. Both factors

are influenced by feed quality and feed quantity, with high BI cows being best suited to achieving the desired production responses.

No general recommendation can be made for all dairy herds within a region, especially in the Kaikoura/Marlborough region. Soil and air temperatures, soil type and rainfall patterns all vary. In most cases, improved management skills applied to improved direct utilisation of pasture dry matter will involve an earlier PS with stocking rates being increased if pasture control cannot be maintained. If a property is in an early development phase with mainly unimproved pastures, it may be preferable to have a later PS, a higher stocking rate especially if the herd is of lower genetic merit.

In both cases, a concentrated calving pattern will be advantageous as it will allow a higher level of reproductive efficiency to be maintained. It should also mean more cows conceive to AB during a limited AB programme. This, in turn, should improve the genetic merit of most herds. Cow quality is clearly important if annual conversion figures for dry matter kg/milkfat kg are to be improved. In addition, these production increases from better managed higher BI cows do not increase costs but do provide an improved return to the herd owner as a reward for his management skills.

"WHAT MAKES A 500 KG PER HECTARE FARM?"

D G Clayton
Senior Technical Officer
RUAKURA

In 1984 the answer has to be:

* High quality cows
* Good quality feed
* Enough cows to eat it
* And the management of these three.

Seems simple but it's true!

When we summarise the percentage increase that can be attributed to these factors alone - I cannot understand why more farmers are not doing 500 kg of milkfat/ha.

Ruakura's No.2 Dairy showed the way 25 years ago. They produced 500 kg in Dr McMeekan's time, and today Dr Bryant at the same Dairy produces about 700 kg. Have our farmers reacted to these research results? Unfortunately many have not reacted, some have done so, and a few have even done better. A good example of the latter would be Gordon Edgecumbe in the Waikato, our current ICI Farmer of the Year. He milks a large herd of 465 cows on 111 ha. He produced 722kg of milkfat/ha, and had an economic farm surplus of $1,700/ha. An outstanding achievement.

* What makes these top farmers tick?

  They all have one thing in common - all concentrate on the key issues, and they all do them well!! Surely there is a lesson here for all of us.

* Just what are these issues?

  Here are the important ones, listed in priority order:

  1) Feed grown
  2) Stocking rate
  3) Cow quality
  4) Stock health
  5) Milking management

  They are all interrelated and all are under farmer control. It's not by accident that we now do 700 kg at No.2 Dairy. We got our act together, and we have all these factors working for us.

Let's look at these individually, and see how they effect production.

Feed Grown What influences the amount of feed we grow?

* Fertiliser: High producing pastures require the right type of fertiliser, supplied in the right amounts. As farmers we should know what essential elements our soils require. Soil analysis is the only way to determine this. I think regular sampling is necessary. Results in one year can be in error and it is much more important to be able to follow trends over years - reduce the number of

samples each year. The place of nitrogen is often debated. It is useful to fill in for feed shortages in spring, and it is useful again in autumn to build up feed for winter and calving.

However, its use should be treated with caution, as results can be variable. Stock of course supply vast amounts of fertiliser via their dung and urine. To be of value this must be evenly spread over the farm.

* New pasture species: These perhaps are not quite so necessary until higher levels of production are reached. However they are superior to the old strains and every opportunity should be taken to incorporate them into rejuvenation programmes. Under or oversowing are quite satisfactory methods. A word of caution. It is essential to find out why the original pasture deteriorated, and correct the mistake.

* Grazing management: This is a comprehensive subject on its own. However the essential elements are some sort of pasture assessment system and feed allocation. Regular and even grazing with enough stock, the avoidance of under or over grazing, and limiting pasture damage by pugging. Of course subdivision and a good water supply are essential. On worn and rundown pastures, there is nothing quite like the old 'hoof and tooth' method to knock them back into good shape.

* Drainage: Drainage has an important role to play. Poorly drained soils lead to poor utilisation of pasture, poor utilisation of fertiliser, and often allows undesirable species to invade the sward. Drainage systems need to be well planned and designed for the particular soil type.

* Weed control: We all know weeds are not milk producing species. We should check the reason for their existence and take steps to eradicate them.

* Conservation: This is where many management systems go astray. No farm can be fully stocked, simply to deal with a spring surplus of feed. Some sort of conservation has to be made, but it should never be made at the expense of under feeding the herd. The first aim of conservation should be to maintain feed quality ahead of the herd. Of lesser importance is the need to supply feed for some other time. We have other alternatives available to us, if we should run short of hay or silage. Of even less importance, is an inherent need to make a regular number of hay bales, or tonnes of silage simply because tradition says its necessary.

Silage is the best bet to deal with surplus feed. It is a more flexible system, in that it can be harvested earlier and its not so reliant on weather. Silage gives better pasture control in spring and gives a better chance of regrowth before summer. Larger areas can be harvested but good storage is essential to reduce wastage. Silage

is a useful substitute for pasture shortage in early lactation, and, again in autumn to hold production and liveweight, while rotations are lengthened as feed is built up for winter and calving.

* While on the subject of the feed grown we must not overlook the quality of this feed. Quality markedly effects the digestibility of the feed and the amount the animal is prepared to eat. I define quality pasture as the ratio of stem to leaf in the sward, the degree of seedhead formation, the amount of dead material, and the clover content. Keeping pastures in a leafy state, minimising seedhead formation, reducing the amount of dead material, all help to hold feed quality. The right stocking rate, conservation, and even topping have a part to play. Clover should not be overlooked. It is a high milk producing feed and its growth should be encouraged. Clover is palatable, does not lose quality and cows eat a lot of it.

* We should now consider how much of this feed we need to grow. Annually we need about 14,000 kg DM/ha to produce 500 kg fat. 90% of this will have to be utilised which means 12,500kg will be eaten by the animals.

If we take a figure of 25 kg of dry matter required to produce 1 kg of fat, then the calculation is $\frac{12,500}{25}$ which gives us 500 kg of fat. So somewhere near 14,000 kg of dry matter would do it - provided we had the right stocking rate to allow this degree of utilisation.

Stocking rate Stocking rate is one of the best weapons we have for increasing production. A high rate, plus a reasonable production per cow (160-170kg), results in high output/ha. If high stocking rates are used, more of the feed grown is directly converted into milk. These high rates put grazing pressure on pastures in spring, this reduces loss through decay and reduces seedhead formation. Also reduces the need for unnecessary and wasteful conservation. To utilise this good feed we are going to grow, how many cows do we need to run? This can be calculated for 12,500 kg of dry matter. If cow quality is high about 3/ha, if its low about 3.5.

It is likely that if per cow production is less than about 160 kg of fat then something is drastically wrong. Cows are too thin at calving, too poorer quality, milking machines are not working properly or the stocking rate needs to be reassessed.

Cow quality At the present time both Ruakura and Massey are doing trials on this subject. We have used the Dairy Board's system of breeding index as the measure of cow quality. Cows with BI's of 100 and 125 have been compared (they are Jerseys). The main points of interest to farmers will be:

- HBI cows produced more over the whole lactation, about 30% or between 1.5 and 2 kg of fat/breeding unit.
- They eat more than their lower breed mates, about 15%.

* They work harder, and are more efficient grazers.
* They are more resilient in that they have the ability to bounce back at anytime from periods of feed shortage.
* High BI cows have the potential for longer lactations. They start the season with a high daily production, they peak at a higher level, and by the end of lactation their daily production is twice that of the low BI's.
* HBI calves are heavier at birth, they grow faster and at calving as 2 year olds are some 45 kg heavier than their lower BI mates. We have maintained the genetic difference between the two groups.

How do we get these good animals? We cull the poor cows and replace them with genetically superior ones. Only proven bulls should be used, and these must have high reliability ratings. We must use these bulls for long enough during the mating season to ensure that all our replacements are by them, we find this difficult unless this is a 6-7 week period. Mate the yearlings to AB. These young animals should genetically be superior to other stock in the herd - why waste time mating them to scrub bulls, replacements from these 2 year olds will speed up our genetic gain. Replacement stock are valuable animals, they should be well reared to reach the desirable weight for weaning, mating and calving.

Mating management is not only critical for production purposes, it is also important in our breeding programme. The aim should be to have good heat detection methods, to get high submission and conception rates, and to end up with a tight calving pattern. For the job to be well done,

good AI facilities are essential. Mating and calving records are of course a must. Culling is part of the programme. Culling should be to replace poor producers - not to replace through mismanagement stock lost during the season. Herd test if finances allow, it is the only sure way to identify individual cow performance. The management sheets the service provides are invaluable in making breeding and culling decisions. Finally, consult the Advisory Services and the Veterinarians on breeding matters, seek their help early before problems arise. Poor mating management or ill advice breeding policies can have long term repercussions.

Stock health Prevention is always better than cure. Fortunately, most of our stock health problems are preventable.

* Herd fertility: A feature of high fertility herds is that they are well fed - before, during and after calving. In other words feeding for production is feeding for reproduction.

* Mastitis: Prevention programmes greatly reduce the losses from this desease. We must treat clinical cases, teat spray, use cell counts for dry cow therapy and cull the persistent offenders.

* Metabolics: Bloat, milk fever and staggers are preventable or the problem can be greatly reduced. We have the programmes, they should be used.

* Leptospirosis: Vaccinate against this disease. Your own health, your family and your employees is at stake.

* Facial Eczema: It is not a problem here, but if the need ever arises we have the programmes available to combat the disease.

Milking management Milking management must be geared to the efficient harvesting of a quality product. Much has been written on this subject but it really comes down to three main points.

* Functionally designed dairies are pleasant places to work in. Adequate yard space for stock, good entry and exit, drafting facilities, and a limitation on non-milking activities are essential. Milking should take no longer than one and a half to two hours.

* Use a 'no fuss' milking system. No wash or volume wash is the order of the day. Stimulation so necessary for the 1960 cow is no longer needed, we now have a modern 1980 version.

* Milking machines and their maintenance, are still the major cause of mastitis. It doesn't matter what brand of machine it is, it must be well serviced. A yearly check is a must. Should an outbreak of mastitis occur, or if production falls for no accountable reason - get it re-checked immediately.

SUMMARY

These then are the 5 key issues that have to be put together on our 500 kg farm. However, one other issue must not be overlooked, that is the role of farm labour. Shortage of labour is no excuse for poor farm performance. If it is needed it should be employed, even if only on a casual basis. Farm labour should be encouraged to participate in management making decisions, and they should be well paid and well housed. My belief is that many farmers spend too much time 'heads down and backsides up', the reverse should be the case. Time spent on financial matters, management planning, and preventing problems occurring - is money in the bank.

This paper was not meant to be a scientific one, I am not a scientist. What I have endeavoured to do is to give an overall picture, and to give some practical guidelines on how we get this 500 kg. There is no magical formula. The key issues properly planned and executed is all that is required. If these are, then of lesser importance are most of the other matters farmers worry about. Notice that no mention has been made about 12 versus 24 hour grazing, number and size of paddocks, rotation lengths and even breed. These are part of the fine tuning of the system.

What I am sure the organisers have really asked me are three questions.

Firstly, do I believe 500 kg is achievable in Kaikoura? Answer is yes. Provided the basics are well done.

Secondly, are there management restraints here that do not exist elsewhere? I doubt this very much. I have not found a dairying area in New Zealand where the basic principles do not apply.

And, Thirdly, why are more farmers here not doing 500 kg? My answer is a straight one - they have not got their act together, or they don't really want to?

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Now I lay me down to sleep
The speakers dull, the subjects deep
If they should stop before I wake,
Give me a nudge for Goodness sake.

We had no such problems at the Kaikoura Dairy Farmers' Conference : 1984

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